# SPECIFICATION
# 产品规格书

REFOND P/N 产品型号

RF-A1T35-WYSE-A9

□R&D 研发

■Mass Production 量产供货

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# 1. Description 产品介绍

## 1.1 产品描述

The Yellow LED,which was fabricated by using a blue chip and the phosphor.

Product Package:3.5mmX3.5mmX1.9mm.

该产品为黄光 LED，是由蓝光芯片激发荧光粉而形成，产品尺寸：3.5mmX3.5mmX1.9mm.。

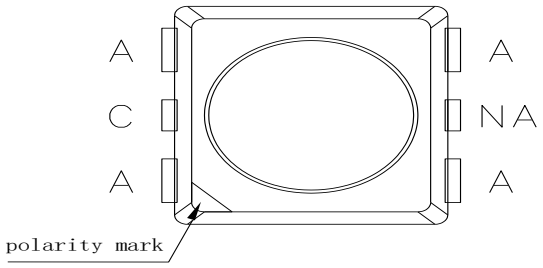
## 1.2Features 产品特征

PLCC6 Package.PLCC6封装

Extremely wide viewing angle.发光角度大

Suitable for all SMT assembly and solder process.适用于所有的SMT组装和焊接工艺

## 1.4Package Dimension 封装尺寸



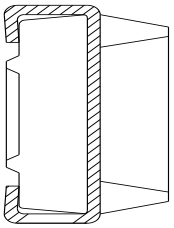



Fig. 1-1 Top View正面视图

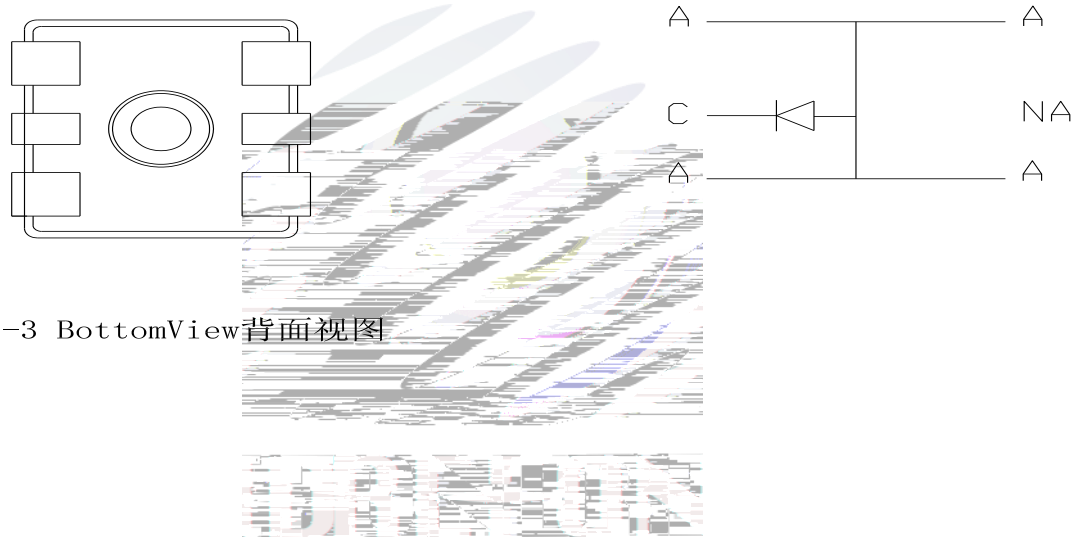



Fig. 1-3 BottomView背面视图

Fig. 1-5 、

Notes 备注:

1. All dimensions units are millimeters. 所有尺寸标注单位为毫米
2. All dimensions tolerances are ±0.05mm unless otherwise noted.除特别标注外，所有尺寸公差为±0.05 毫米

## 1.5Product Parameters 产品参数

Table 1-1 Electrical / Optical Characteristics at Ts=25°C 电性与光学特性

| Item<br>项目 | Symbol<br>符号 | Test Condition<br>测试条件 | Value | | | Unit<br>单位 |
|---|---|---|---|---|---|---|
| | | | Min.<br>（最小值） | Typ.<br>（典型值） | Max.<br>（最大值） | |
| Forward Voltage<br>（正向电压） | $V_F$ | $I_F$=150mA | 2.8 | 3.1 | 3.4 | V |
| Reverse Current<br>（反向电流） | $I_R$ | $V_R$=5V | --- | --- | 10 | uA |
| Luminous Flux<br>（光通量） | | $I_F$=150mA | 40.9 | 43 | 55.3 | lm |
| Viewing Angle<br>（发光角度） | | $I_F$=150mA | --- | 120 | --- | deg |
| Thermal Resistance.<br>（热阻） | $R_{THJ-S}$ | $I_F$=150mA | --- | --- | 50 | /W |

Table 1-2 Absolute Maximum Ratings at Ts=25°C 绝对最大值

| Parameter（参数） | Symbol（符号） | Rating（值） | Units（单位） |
|---|---|---|---|
| Power Dissipation<br>（功耗） | $P_D$ | 612 | mW |
| Forward Current<br>（正向电流） | $I_F$ | 180 | mA |
| Peak Forward Current<br>（峰值电流） | $I_{FP}$ | 300 | mA |
| Reverse Voltage<br>（反向电压） | $V_R$ | 5 | V |
| Electrostatic Discharge<br>(HBM)（静电） | $E_{SD}$ | 8000 | V |
| Operating Temperature<br>（操作温度） | $T_{OPR}$ | -40 ~ +110 | |
| Storage Temperature<br>（储存温度） | $T_{STG}$ | -40 ~ +110 | |
| Junction Temperature<br>（结温） | $T_J$ | 125 | |

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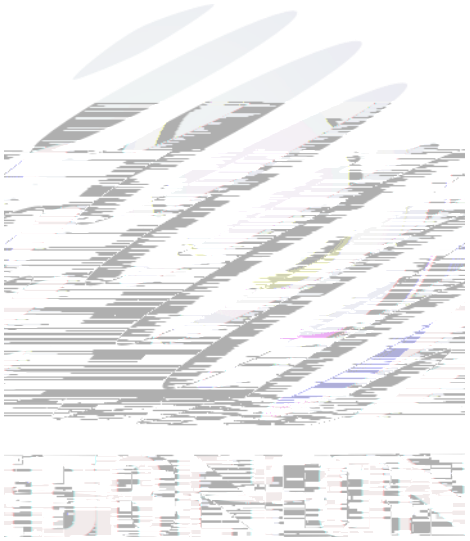
Notes 备注:

1. 1/10 Duty cycle, 10ms pulse width. 脉宽10ms,占空比1/10.

2. The above forward voltage measurement allowance tolerance is ±0.1V. 以上所示电压测量误差 ±0.1V.

3. The above color coordinates measurement allowance tolerance is ±0.005. 以上所示坐标测量误差± 0.005.

4. T



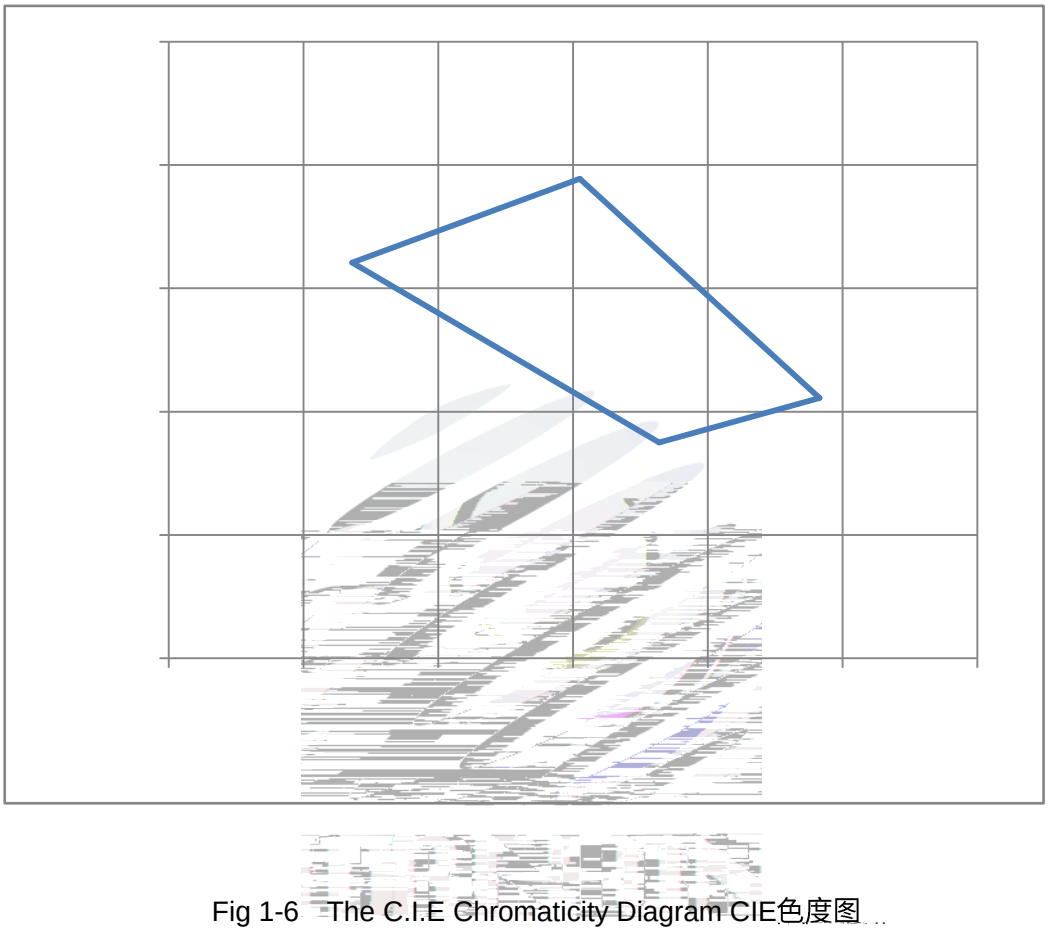


Fig 1-6 The C.I.E Chromaticity Diagram CIE色度图

Table 1-4

| BINCODE | CIE-X1 | CIE-Y1 | CIE-X2 | CIE-Y2 | CIE-X3 | CIE-Y3 | CIE-X4 | CIE-Y4 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

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## 1.7 Typical Optical Characteristics Curves 典型光电特性曲线

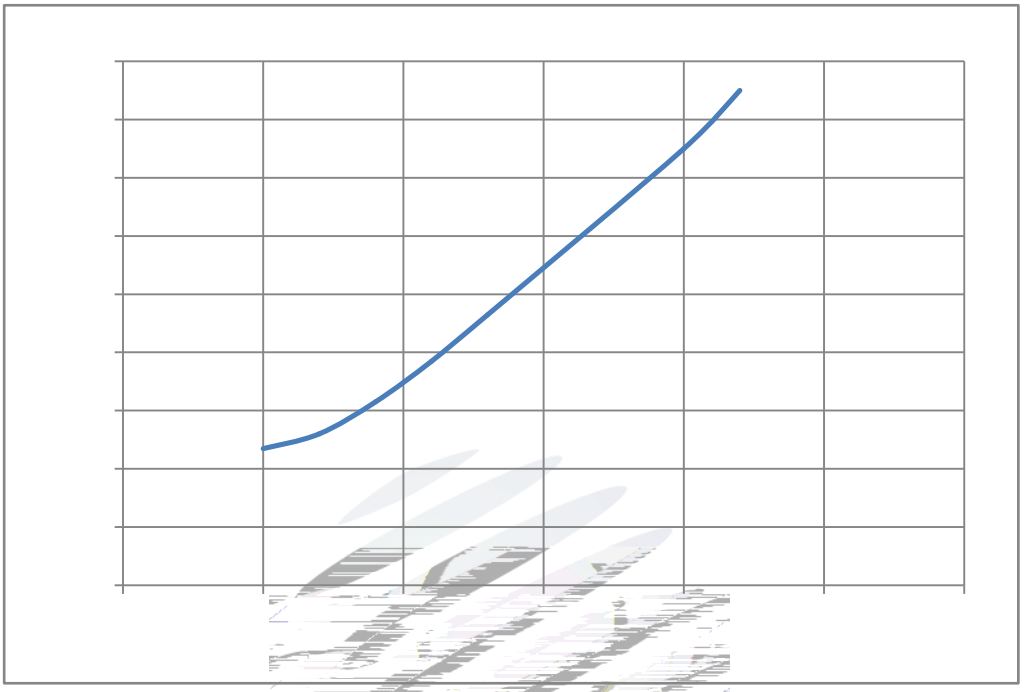

Fig. 1-7 Forward Voltage Vs Forward Current伏安特性曲线

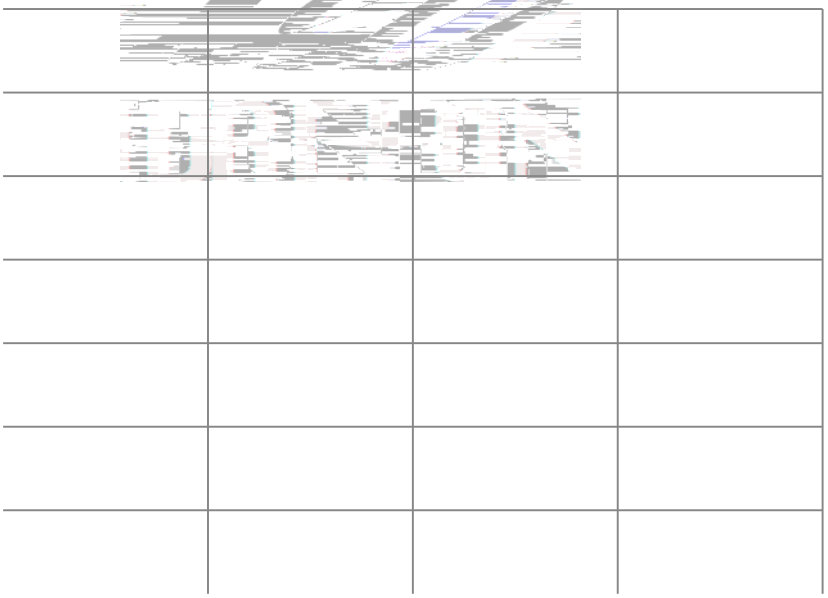

Fig. 1-8 Forward Current Vs Relative Intensity正向电流与相对光强特性曲线

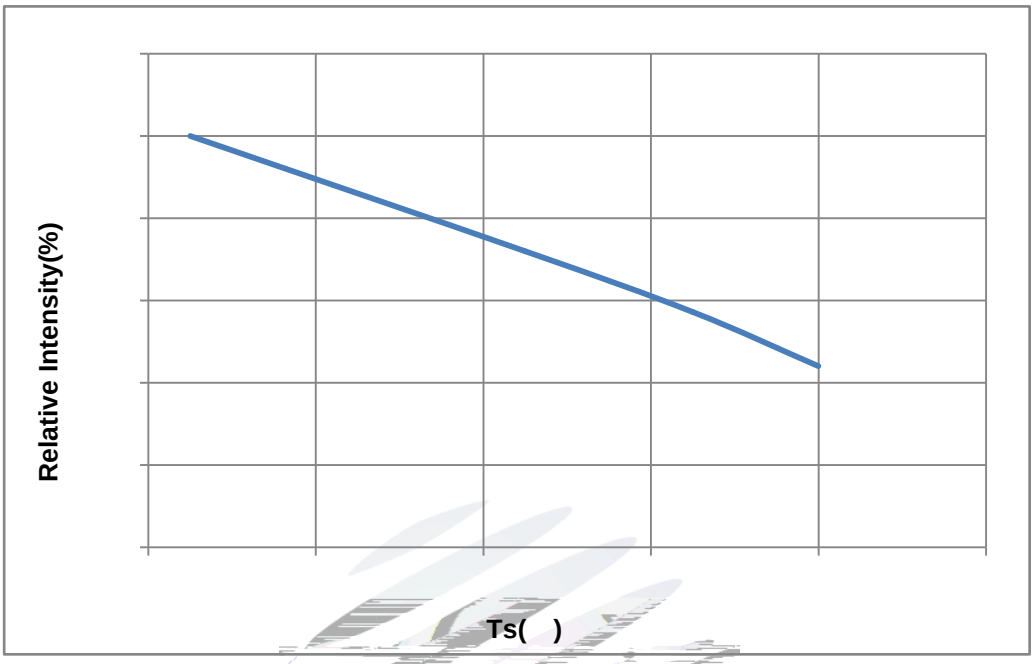


Fig. 1-9 Solder Temperature Vs Relative Intensity管脚温度与相对光强特性曲线

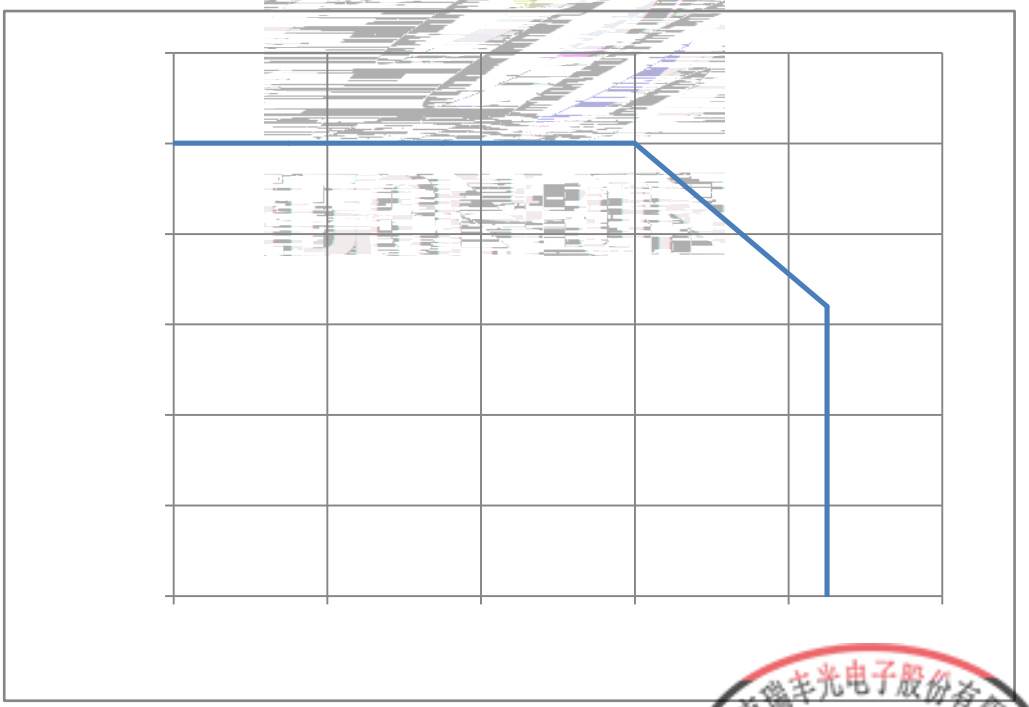

Fig. 1-10 Solder Temperature VsForward Current管脚温度与正向电流特性曲线

Tj≤150℃

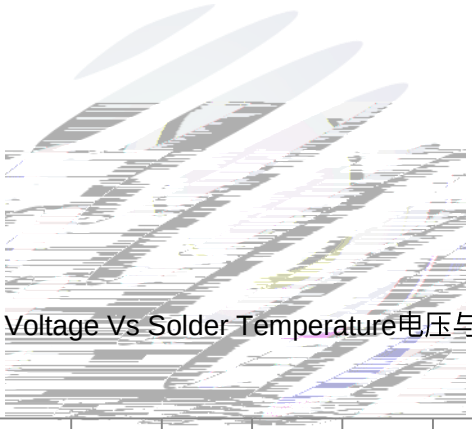

Fig. 1-11 Forward Voltage Vs Solder Temperature电压与管脚温度特性曲线

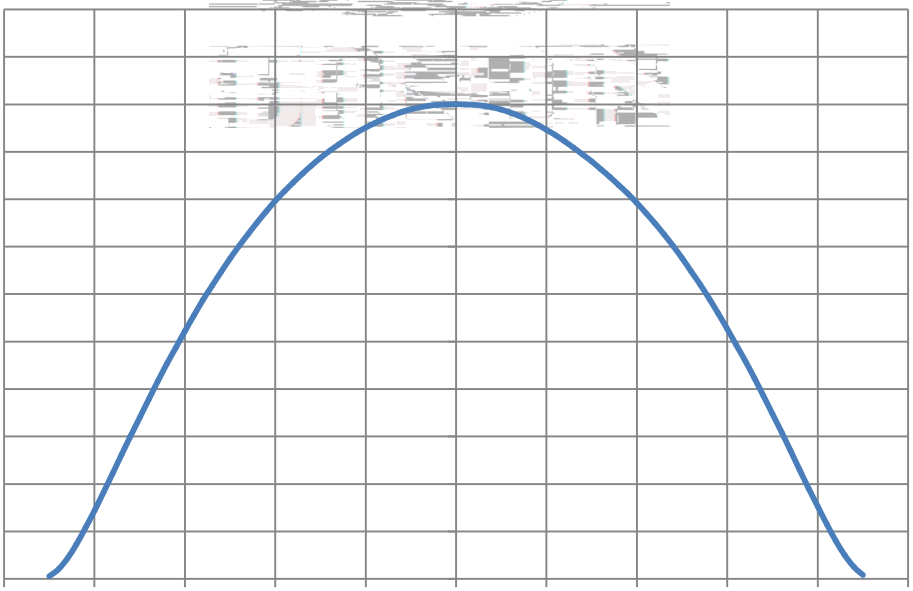

Fig. 1-12 Radiation diagram辐射特性曲线

Fig. 1-13 Chromaticity Coordinate Vs Solder Temperature色坐标与管脚温度特性曲线

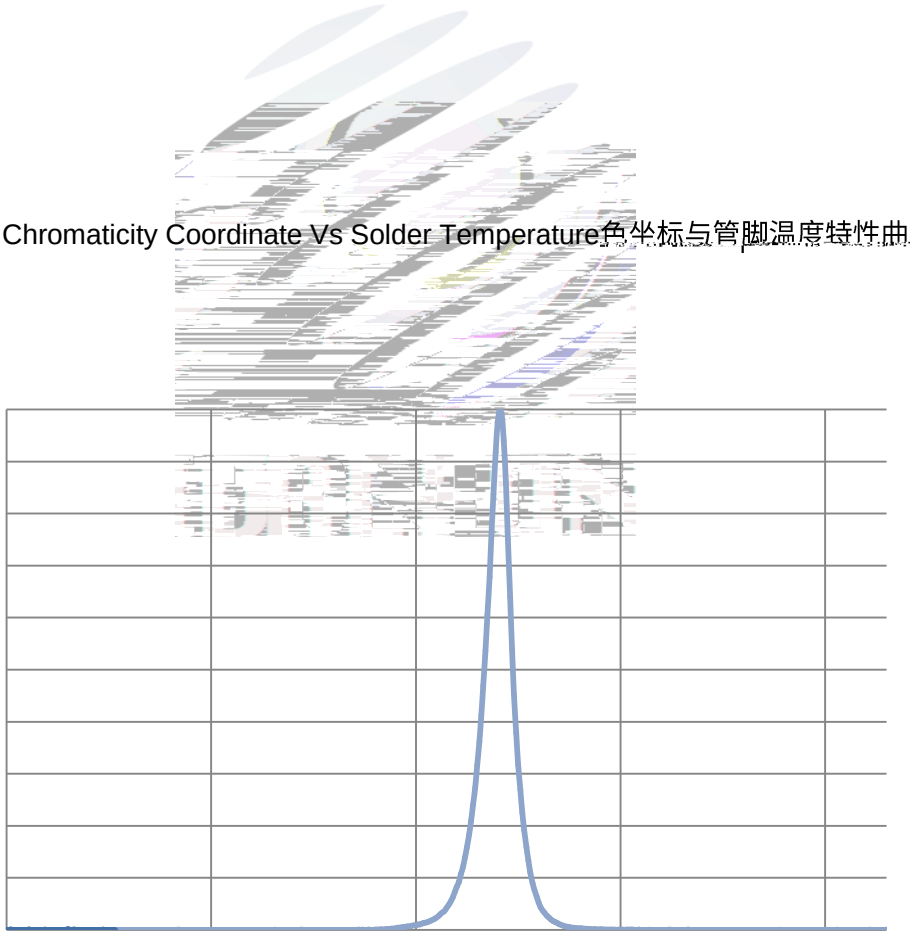

Fig. 1-14 Spectrum Distribution光谱分布特性曲线

# 2. Packaging产品包装

## 2.1 Packaging Specification 包装规格

Package:4000pcs/reel.包装每卷 。

2.1.1Carrier Tape Dimension 载带尺寸

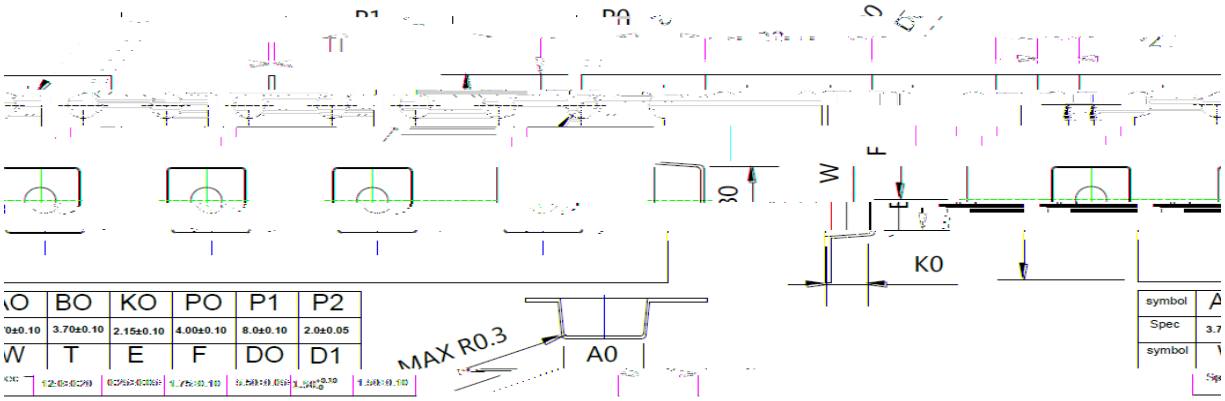


Fig.2-1 Carrier Tape Dimension 载带尺寸

2.1.2Reel Dimension 卷盘尺寸

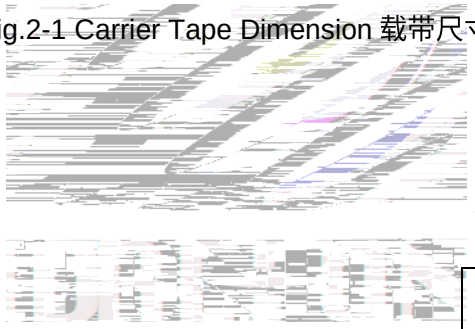

Table 2-1Reel Dimension 卷盘尺寸

| | |
|---|---|
| A | 12±0.1mm |
| B | 330±1mm |
| C | 100±1mm |
| D | 13.0±0.5mm |

Fig.2-2Reel Dimension 卷盘尺寸

Notes 备注:

The tolerances unless mentioned ±0.1mm. Unit : mm注：未注公差为±0.1毫米，尺寸单位：毫米

### 2.1.3Label Form Specification 标签规格

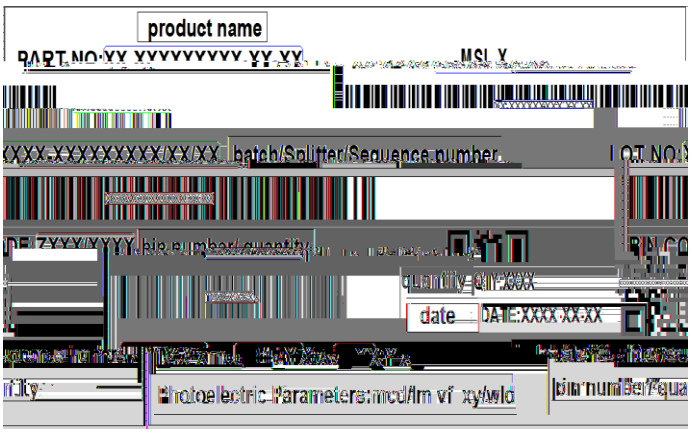


Fig. 2-3 Label 标签

Table 2-2 Specification 规格

| | |
|---|---|
| PART NO. | Part Number 品名 |
| SPEC NO. | Spec Number 规格 |
| LOT NO. | Lot Number 批次号 |
| BIN CODE | Bin Code 参数代码 |
| | Luminous flux 光通量 |
| XY | Chromaticity Bin 色区 |
| $V_F$ | Forward Voltage 正向电压 |
| WLD | Wavelength 波长代码 |
| QTY | Packing Quantity 数量 |
| DATE | Made Date 生产日期 |

## 2.2Moisture Resistant Packing 防潮包装

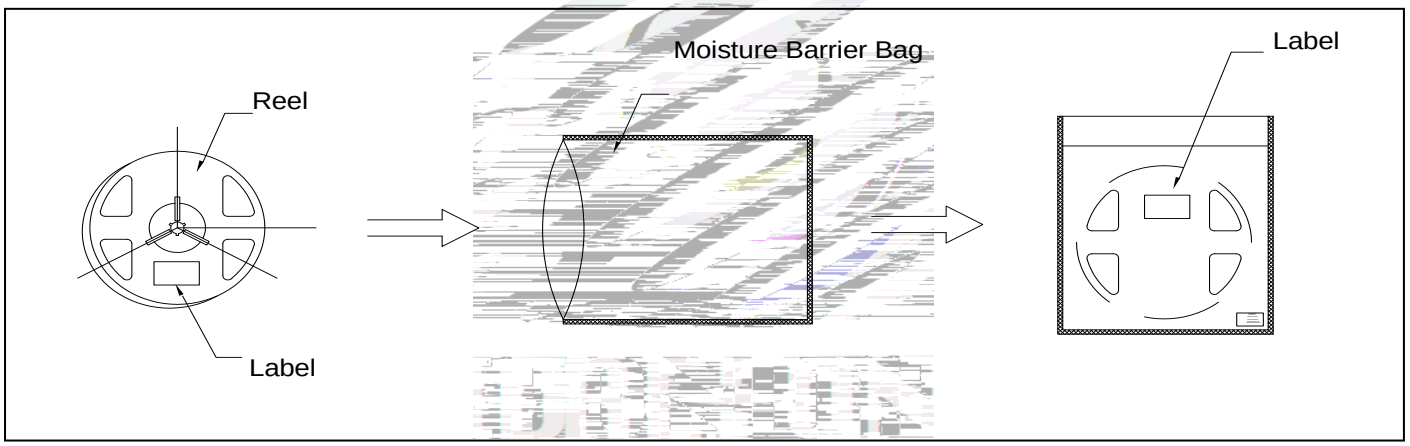


Fig.2-4Moisture Resistant Packing

## 2.3Cardboard Box 包装纸箱

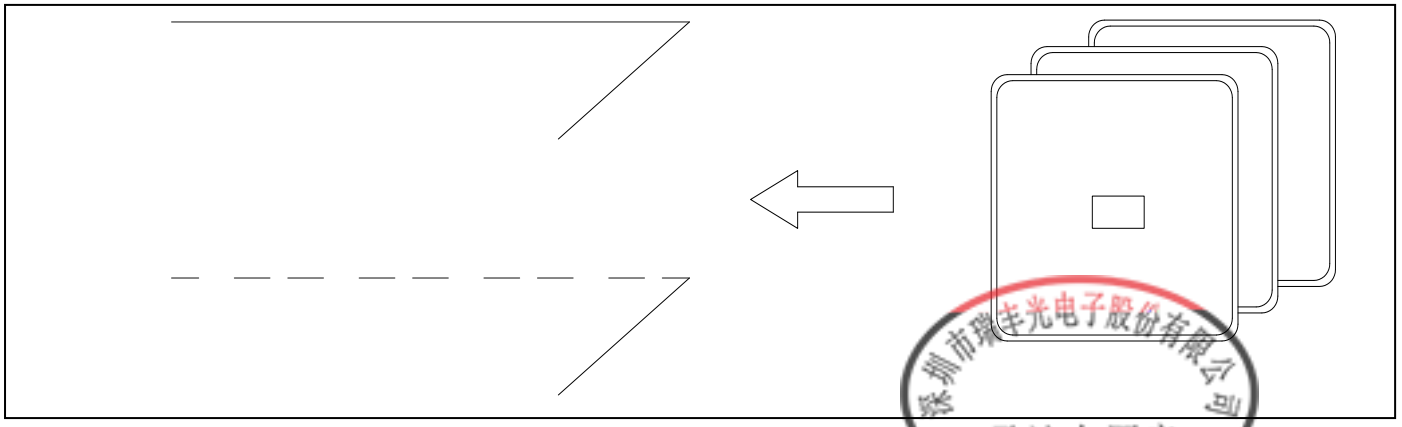

Fig.2-5Cardboard Box

## 2.4Reliability Test Items And Conditions 信赖性测试项目及条件

Table 2-3 **Reliability Test Items And Conditions 信赖性测试项目及条件**

| TestItems<br>项目 | Ref.Standard<br>参考标准 | Test Condition<br>测试条件 | Time<br>时间 | Quantity<br>数量 | Ac/Re<br>接收/拒收 |
|---|---|---|---|---|---|
| Reflow<br>回流焊 | JESD22-B106 | Temp:260℃max<br>T=10 sec | 2times | 20pcs. | 0/1 |
| MSL2<br>防潮等级2 | JESD22-A113 | 85℃/ 60%$R_H$ | 168 hrs. | 20pcs. | 0/1 |
| Thermal Shock<br>冷热冲击 | JEITAED-4701 300307 | -40℃ 15min<br>10s<br>125℃ 15min | 1000 cycle | 20pcs. | 0/1 |
| Life Test<br>高温测试 | JESD22-A108 | Ta=105℃<br>$I_F$=150mA | 1000hrs. | 20pcs. | 0/1 |
| High Temperature<br>High Humidity Life Test<br>高温高湿测试 | JESD22-A101 | 85℃/ 85%$R_H$<br>$I_F$=150mA | 1000hrs. | 20pcs. | 0/1 |

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## 2.5 Criteria For Judging Damage 失效判定标准

Table 2-4**Criteria For Judging Damage 失效判定标准**

| Test Items 项目 | Symbol 符号 | Test Condition 测试条件 | Criteria For Judgement 判定标准 | |
|---|---|---|---|---|
| | | | Min. 最小 | Max. 最大 |
| Forward Voltage 正向电压 | $V_F$ | $I_F$=150mA | - | U.S.L*)x1.1 |
| Reverse Current 反向电流 | $I_R$ | $V_R$ = 5V | - | U.S.L*)x2.0 |
| Luminous Flux 光通量 | | $I_F$=150mA | L.S.L*)x0.7 | - |

Notes 备注:

1.U.S.L: Upper standard level 规格上限 L.S.L: Lower standard level 规格下限

2.The above reliability tests is based on the verification of a single/strip LED of Refond's existing experimental platform,the reliability experiment was taken under good heat dissipation conditions. when customers applies the LED to the series and parallel circuit, should take consideration of all the factors such as the current, voltage distribution, heat dissipation and others.以上可靠性测试是基于瑞丰现有实验平台单颗/条 LED 在良好散热条件验证下的结果。客户端将 LED 应用于串、并联线路时，需自行评估电流、电压分配、散热等问题。

3.The technical information shown in the data sheets is limited to the typical characteristics and circuit examples of the referenced products. It does not constitute the warranting of industrial property nor the granting of any license. 以上技术数据仅为产品的典型值，只作为参考，不作为任何应用条件及应用方式的保证。

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# 3. SMT Reflow Soldering Instructions SMT 回流焊说明

## 3.1SMT Reflow Soldering Instructions SMT 回流焊说明

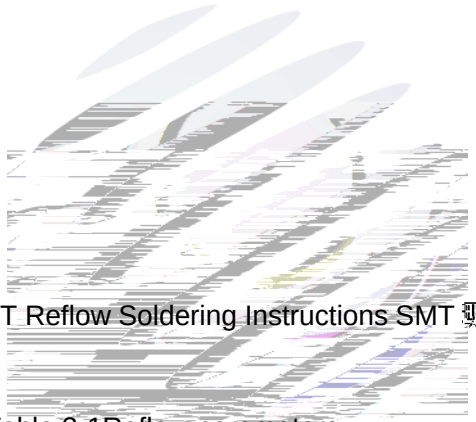

Fig.3-1SMT Reflow Soldering Instructions SMT 回流焊说明

Table 3-1Reflow parameters

| | |
|---|---|
| Average temperature rise speed平均升温速度（Tsmax 至$T_P$） | 最高3 °C/秒 Max 3 °C/ s |

Notes 备注:

(1)Reflow soldering should not be done more than twice. If more than 24 hours between the two solderings , LED will be damaged. 回流焊次数不可以超过两次，两次回流焊的时间间隔如果超过24小时，LED可能由于吸湿而损坏。

(2)Whensoldering , do not put stress on the LEDs during heating.当焊接时，不要在材料受热时用力压胶体表面。

### 3.1.1 Soldering Iron 烙铁焊接

(1) When do soldering by hand, keep the temperature of iron below less 300 less than 3 seconds. 当手工焊接时,烙铁的温度必须小于300℃，时间不可超过3秒。

(2) Soldering by hand should be done only one time.手工焊接只可焊接一次。

### 3.1.2 Repairing 修补

Repairing should not be done after the LEDs have been soldered. When repairing is unavoidable,a double-head soldering iron should be used (as below figure). It should be confirmed in advance whether the characteristics of LEDs will or not be damaged by repairing.

LED回流焊后不应该修复，当必须修复时，必须使用双头烙铁，而且事先应确认此种方式会不会损坏LED本身的特性。

### 3.1.3 Cautions 注意事项

(1) The encapsulated material of the LEDs is silicone. Therefore the LEDs have a soft surface on the top of package. The pressure to the top surface will be impacted on the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So when usethe picking up nozzle, the pressure on the silicone resin should be proper. LED封装胶为硅胶，表面较软，用力按压胶体表面会影响LED可靠性，因此应

(2) Components should not be mounted on warped (non coplanar) portion of PCB. After soldering, do not warp the circuit board.LED 灯珠不要焊接在弯曲的 PCB

(3) Do not apply mechanical force or excess vibration during the cooling process to normal temperature after soldering. Do not rapidly cool device after soldering.回流焊之后冷却过程中，不要对材料实加外力，也不要有震动，回流焊后，不要采用激剧冷却的方式。

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# 4. Handling Precautions 产品使用注意事项

## 4.1 Handling Precautions 产品使用注意事项

(1) LED operating environment and sulfur element composition cannot be over 100PPM in the LEDmating usage material. This is provided for informational purposes only and is not a warranty or endorsement.LED 工作环境及与 LED 适配的材料中硫元素及化合物成份不可超过 100PPM.这只是一个建议，不作任何品质担保。

(2) In order to prevent ex-ternal material from getting into the inside of LED, which may cause the malfunction of LED, the single content of Bromine element is required to be less than 900PPM,the single content of Chlorine elementis required to be less than 900PPM,the total content of Bromine element and Chlorine element in the external materials of the application products is required to be less than 1500PPM. This is provided for informational purposes only and is not a warranty or endorsement.为了防止外界物质进入 LED 内部以造成 LED 的损伤，所处环境及所用套件等等，单一的溴元素含量要求小于 900PPM，单一氯元素含量要求小于 900PPM，溴元素与氯元素总含量必须小于 1500PPM. 这只是一个建议，不作任何品质担保。

(3) VOCs (Volatile organic compounds) emitted from materials used in the construction of fixtures can penetrate silicone encapsulants of LEDs and discolor when exposed to heat and photonic energy. The result can be a significant loss of light output from the fixture. Knowledge of the properties of the materials selected to be used in the construction of fixtures can help prevent these issues. Refond advises against theuse of any chemicals or materials that have been found or are suspected to have an adverse affect on device performance or reliability. To verifycompatibility, Refond recommends that all chemicals and materials be tested in the specific application and environment for which they are intended tobe used. Attaching LEDs, do not use adhesives that outgas organic vapor. 应用套件中的挥发性物质会渗透到 LED 内部，在通电产生光子及热的条件下，会导致 LED 反射使后任何对 变色，进而造成严重光衰。提前了解套件材料能够避免产生这些问题。瑞丰 LED 照件的性能或者可靠性有害的物质或材料，不管这些材料是已经证实了的还是仅仅怀疑有害。针对特定的用途和使用环境，瑞丰建议对所有的物质和材料进行相容性的测试。在贴装 LED 时候，不要使用能产生有机挥发性气体的粘结剂。

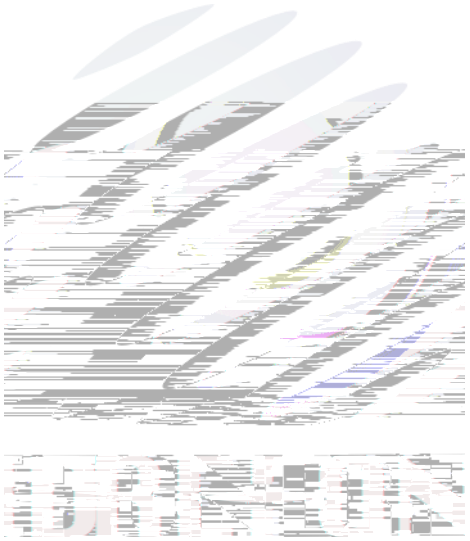
(4) Handle the component along the side surface by using forceps or appropriate tools; Do not directlytouch or Handle the silicone lens surface, it may damage the internal circuitry.通过使用适当的工具从材料侧面夹取，不可直接用手或尖锐金属压胶体表面，它可能会损坏内部电路。

Table 4-1Storage 储存

| Conditions 种类 | | Temperature 温度 | Humidity 湿度 | Time 时间 |
|---|---|---|---|---|
| Storage | Before Opening Aluminum Bag 拆包前 | ≤30℃ | ≤75% | Within 1 Year From Date 一年内 |
| | After Opening Aluminum Bag 拆包后 | ≤30℃ | ≤60% | Recommended for use within 24 hours 建议24小时内使用 |
| Baking 烘烤 | | 60±5℃ | - | ≥24hours 大于24小时 |

(8) If the moisture absorbent material silica gel has faded away or the LEDs have exceeded the storage time,baking treatment should be performed after unpacking and based on the following condition 60 5

| Date日期 | Revisor修订者 |
| --- | --- |



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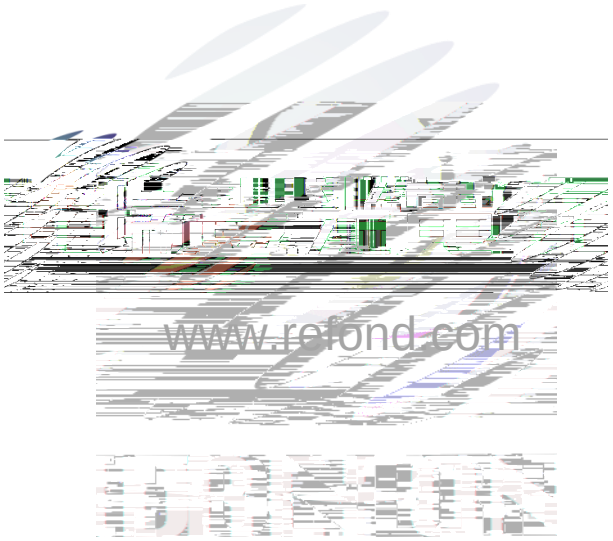


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Declare 申明

This specification is written both in English and in Chinese and the latter is formal.

产品规格书以中英文方式书写，若有冲突以中文版本为准。